

Complicated Airway Due to Unexpected Lingual Tonsil Hypertrophy

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We report an unexpected failed laryngeal mask airway in a patient with unrecognized lingual tonsil hypertrophy (LTH). A 19-year-old obese woman presented for extraction of multiple teeth via intravenous general anesthesia. Surgery was interrupted due to a laryngospasm midway through the procedure. The laryngospasm required the existing laryngeal mask airway to be removed so the patient could be suctioned. Although it is unclear the extent of obstruction caused by LTH, the surgery had to be postponed due to the discovery of enlarged lingual tonsils, which prevented endotracheal intubation. One reason for unexpected difficult airways is attributed to LTH. It is recognized that LTH is more common in patients with obstructive sleep apnea; however, LTH also has an increased prevalence in obese children with prior palatine tonsillectomies or adenoidectomies. Unexpected LTH can complicate general anesthesia by making placement of a laryngeal mask airway difficult. Thus, further research needs to be conducted to gain a deeper understanding on how to reduce the risks presented by LTH during sedation surgeries.

Key Words: Lingual tonsil hypertrophy; Endotracheal intubation; Laryngospasm; Anesthesia; Sedation; Complication; Intubation.

Patients with a normal preoperative assessment have been found to have a 1–4% incidence of difficult endotracheal intubation and are impossible to intubate in 0.05–0.35%¹ of anesthetics. Lingual tonsils are often overlooked during a routine preoperative anesthesia evaluation, yet inflammation of the lingual tonsils has been linked to serious morbidity and mortality.^{2–4} Consisting of lymphoid tissue, the lingual tonsils are located at the base of the tongue (Figure) between the circumvallate papilla anteriorly and the epiglottis posteriorly.⁵ When enlarged, the lingual tonsils appear as 2 masses divided by the glossoepiglottic fold. Varying in size, they may become so distinct that they displace the epiglottis posteriorly.^{2,5–8} Lingual tonsil hypertrophy (LTH) can not only lead to sleep disorders such as obstructive sleep apnea, but it also can obstruct the airway during surgery, making intubation difficult.⁹ We report this case as a reminder of the

importance of not overlooking this structure in our preoperative evaluation.

CASE PRESENTATION

A 19-year-old woman presented for removal of her third molars and supernumerary teeth under general anesthesia. Her preoperative evaluation revealed a weight of 120.5 kg (265 lb) and a height of 167.6 cm (5 ft 6 in) with a body mass index of 42.8. Her past medical history included insomnia, for which she did not receive any medications. She had undergone a tonsillectomy at the age of 11 years with no surgical or anesthetic complications. She is a university student who denied any use of tobacco, alcohol, or recreational drugs. An intraoral soft tissue exam indicated no visible lesions on hard palate, soft palate, oropharynx, buccal mucosa, floor of the mouth, or dorsal and ventral surfaces of the tongue. She had a skeletal-dental class I relationship with malopposed, impacted third molars as the only obvious pathology. She had a Mallampati class III airway with a normal thyromental distance.

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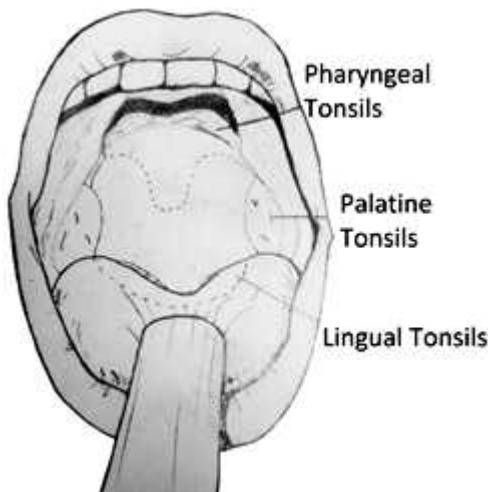
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Lingual tonsil diagram.

She presented on the morning for surgery with an escort and had nothing by mouth for 8 hours. Prior to inserting the intravenous catheter, she was monitored with intermittent noninvasive blood pressure at 5-minute intervals, continuous pulse oximetry, 3-lead electrocardiogram, pretracheal stethoscope, and a temperature probe. A 22-gauge intravenous catheter was placed in the right hand.

She was given 2.5 mg (0.02 mg/kg) of midazolam and 50 µg (0.41 µg/kg) of fentanyl, along with 0.2 mg (0.0017 mg/kg) glycopyrrolate prior to induction. She was preoxygenated by mask and was induced with 200 mg (1.66 mg/kg) of propofol and 100 µg (0.83 µg/kg) of remifentanil. She was easily ventilated manually via a full-face mask, which was confirmed with an end-tidal CO₂ monitor and good breath sounds through the pretracheal stethoscope. A size 5 LMA ProSeal (LMA North America) laryngeal mask airway was inserted with little resistance and inflated with 35 mL air. Breath sounds and end-tidal CO₂ confirmed placement with a small leak at 20 cm of H₂O pressure. Anesthesia was maintained with 1 L/min O₂, 1 L/min N₂O, and 2% sevoflurane. Twenty minutes into the procedure, the dentist anesthesiologist noticed a leak in the LMA with some gurgling sounds through the pretracheal stethoscope. It was suspected that the LMA was dislodged and normal saline irrigation and possibly blood from the procedure had collected around the larynx. A few seconds after hearing the air leak, the patient had a laryngospasm and stopped ventilating. Positive pressure via the LMA was unsuccessful in breaking the laryngospasm. The LMA was removed, and the patient was suctioned aggressively with a Yankauer tonsillar suction (McKesson). A face mask was placed and another attempt to break the laryngospasm was unsuccessful with the use of positive pressure. When her oxygen saturation dropped

to 87%, a decision was made to immediately intubate the trachea orally. The patient was then given 120 mg (1 mg/kg) of succinylcholine (Anectine, Sandoz Pharmaceuticals Inc) intravenously. After skeletal muscle fasciculation, the patient was easily mask ventilated with positive pressure oxygen. The attempt to intubate the trachea via direct laryngoscopy was unsuccessful on 2 attempts due to the lack of visualization of the glottis from an excess of hypertrophic tissue at the base of the tongue. Intubation was attempted with both MacIntosh #3 and #4 blades and a Miller #3 blade (SunMed Greenline). She was again easily mask ventilated until she started to breathe spontaneously. Her oxygen saturation quickly rose and stabilized at 100%, and she was hemodynamically stable with a blood pressure of 130/79 mm Hg and a pulse rate of 89 beats/min. Even though she could be ventilated, a decision was made to terminate the case and initiate a further work-up prior to the development of any additional anesthetic complications. During the recovery period, evaluation of the airway with the patient in a sitting position again demonstrated the lingual tonsil hypertrophy with the aid of a laryngeal mirror.

DISCUSSION

It is difficult to anticipate complications arising from LTH because it often occurs in asymptomatic individuals. However, patients with LTH may present with a number of symptoms including sore throat, dysphagia, globus sensation, snoring, feeling of having a lump in the throat, alteration of voice, chronic cough, snoring, and obstructive sleep apnea.^{4,7} Additionally, two thirds of patients with LTH have had a palatine tonsillectomy or adenoidectomy.⁶ Research at Cincinnati Children's Hospital Medical Center found that obese children have a higher frequency of LTH, with a slightly higher occurrence in children with previous tonsillectomies.¹⁰ While our patient did not report any of the typical symptoms, she did fall at a higher risk because of obesity and a history of prior tonsillectomies. Thus, it is recommended that for individuals at a higher risk for LTH, their surgeons check for LTH prior to surgery. LTH can be detected using a simple laryngeal mirror.⁶

While it is unclear the extent of airway obstruction caused by LTH in our case, the enlargement of the patient's lingual tonsils prevented endotracheal intubation when a more stable airway was needed following a laryngospasm. The use of an LMA is controversial in patients with LTH; however, there are several cases in which the LMA was successfully used in patients with obstructed airways.^{8,11,12} Additionally, the LMA has successfully been used in "cannot-intubate-cannot-ventilate" situations because the LMA requires less time and is less invasive than other techniques such as a tracheostomy.⁴

However, Davies et al⁸ warn against repeated attempts using the LMA because of potential damage to the surrounding tissue. Repeated insertions of the LMA can prove traumatic to the airway by causing lingual tonsil edema or bleeding.^{7,11} It could even lead to a “cannot-intubate–cannot-ventilate” situation, which we wished to avoid. When unable to intubate via LMA, fiberoptic intubation has proven to be more successful because fiberoptic intubation avoids damaging the tonsillar tissue.¹¹ Asbjornsen et al⁷ recommend awake fiberoptic intubation for patients with known LTH. However, in the event of an unanticipated difficult intubation scenario, intubation via an ENT laryngoscope is recommended.⁸ Since neither fiberoptic intubation nor video laryngoscopy were available in our office, the decision to attempt to place an oral endotracheal tube via traditional direct laryngoscopy was made. Upon discovery of LTH, extra precaution was taken to not further aggravate the tissue when our initial intubation attempt was unsuccessful, so the anesthetic was terminated.

In summary, unexpected LTH presents many complications during general anesthesia, and further research needs to be conducted on innovative intubation methods to make anesthesia safer for patients with LTH. It is vital for anesthesiologists to be aware of the possibility of enlarged lingual tonsils, particularly in patients with increased risk for LTH prior to intubation in order to be prepared. A significant amount of research has been conducted on LTH in patients with Down syndrome or obstructive sleep apnea.^{10,13} However, key indicators for hypertrophy in otherwise healthy patients are obesity and previous tonsillectomies.^{7,8,10,14} Enlargement of the lingual tonsils most likely occurs as a compensatory mechanism for the loss of the palatine or adenoid tonsils.^{5,8,15} Being aware of such issues may help curtail unexpected complications.

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